

Bogdanovite**(Au, Te, Pb)₃(Cu, Fe)**

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Crystal Data: Cubic. *Point Group:* $4/m\bar{3}2/m$ (by analogy to AuCu₃). In radial crystal aggregates, to 1 mm; massive.

Physical Properties: Hardness = n.d. VHN = 235–270 (Cu-rich), 290–354 (Fe-rich) (20 g load). D(meas.) = n.d. D(calc.) = n.d.

Optical Properties: Opaque. *Color:* Rose-brown to bronze-brown; quickly tarnishes in air to bluish black; unusual color effects in polished section, from purple-raspberry or grayish lilac to gold and yellow. *Luster:* Semimetallic.

R₁–R₂: (400) —, (420) 11.8–15.8, (440) 10.5–15.2, (460) 9.2–14.8, (480) 8.0–14.8, (500) 6.9–16.9, (520) 6.2–22.5, (540) 5.6–29.5, (560) 6.1–34.5, (580) 8.4–37.6, (600) 13.5–39.2, (620) 21.0–40.0, (640) 29.5–39.8, (660) 36.2–39.0, (680) 41.2–37.7, (700) 44.9–35.7

Cell Data: *Space Group:* $Pm\bar{3}m$. $a = 4.0876(15)$ $Z = 1$

X-ray Powder Pattern: Russia or Kazakhstan. 2.36 (100), 1.230 (80), 2.045 (60), 1.447 (60), 1.180 (30), 1.092 (25), 0.992 (15)

Chemistry:	(1)
Au	61.8
Ag	3.39
Cu	11.2
Fe	1.18
Pb	13.1
Te	10.2
Total	100.87

(1) Kazakhstan; by electron microprobe, corresponding to $(\text{Au}_{1.83}\text{Te}_{0.47}\text{Pb}_{0.37}\text{Ag}_{0.18})_{\Sigma=2.85}(\text{Cu}_{1.03}\text{Fe}_{0.12})_{\Sigma=1.15}$. Cu and Fe vary reciprocally from Cu:Fe = 0.91:0.09 to 0.22:0.78.

Occurrence: In the oxidation zone of Au–Te deposits.

Association: Gold, bilibinskite, bezsmertnovite, belyakinite, tellurides of Fe, Cu, Pb (Aginsk deposit, Russia).

Distribution: From the Aginsk gold telluride deposit, Kamchatka, Far Eastern Region, Russia [TL]. At the Southern Dzhelambet deposit, central Kazakhstan [TL]. From Bisbee, Cochise Co., Arizona, USA.

Name: For Soviet geologist Aleksei Alekseevich Bogdanov (1907–1971), Moscow University, Moscow, Russia.

Type Material: Mining Institute, St. Petersburg, 1115/1; A.E. Fersman Mineralogical Museum, Academy of Sciences, Moscow, Russia, 79408.

References: (1) Spiridonov, E.M. and T.N. Chvileva (1979) Bogdanovite, Au₅(Cu, Fe)₃(Te, Pb)₂, a new mineral of the group of intermetallic compounds of gold. *Vestnik Moskva Univ., Ser. Geol.*, 1, 44–52 (in Russian). (2) (1979) *Amer. Mineral.*, 64, 1329 (abs. ref. 1). (3) Bayliss, P. (1990) Revised unit-cell dimensions, space group, and chemical formula of some metallic minerals. *Can. Mineral.*, 28, 751–755. (4) Criddle, A.J. and C.J. Stanley, Eds. (1993) *Quantitative data file for ore minerals*, 3rd ed. Chapman & Hall, London, 53.